PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Tadatomo et al.

Application No. 09/787,502

Art Unit: 2815

Examiner: E. Ortiz

Filed: March 16, 2001

For: SEMICONDUCTOR LIGHT RECEIVING ELEMENT

PENDING CLAIMS AFTER AMENDMENTS MADE IN RESPONSE TO OFFICE ACTION DATED JULY 3, 2002

2. A semiconductor light receiving element comprising a light receiving layer comprising a GaN group semiconductor and an electrode formed on one surface of the light receiving layer as a light receiving surface in such a manner that the light can enter the light receiving layer, wherein the light receiving element is a Schottky barrier type light receiving element in which light enters a depletion layer formed under the electrode, which extends to cover a small area around the electrode from the side the electrode is formed, said light receiving layer is a first conductivity type layer, said electrode formed on said light receiving surface comprises at least a Schottky electrode, and a total of boundary lines between areas of the light receiving surface covered with the Schottky electrode and exposed areas is longer than the length of the outer periphery of the light receiving surface.

3. The light receiving element of claim 2, wherein the Schottky electrode has a wiring pattern formed by strip conductors in combination.

4. The light receiving element of claim 2, wherein the strip conductors have a width of 0.1 μm – 2000 μm.

5. The light receiving element of claim 2, wherein the wiring pattern is a comblike pattern.

6. The light receiving element of claim 2, wherein the light receiving layer is an uppermost layer of a laminate comprising one or more layers comprising a first conductivity

type GaN group semiconductor formed on a crystal substrate, wherein the light receiving element comprises an ohmic electrode formed on a layer other than the light receiving layer.

7. The light receiving element of claim 6, wherein the crystal substrate is made from a conductive material and the ohmic electrode is formed on the crystal substrate.

8. A semiconductor light receiving element comprising a light receiving layer comprising a GaN group semiconductor and an electrode formed on one surface of the light receiving layer as a light receiving surface in such a manner that the light can enter the light receiving layer, wherein the light receiving element is a photoconductive type light receiving element, the light receiving layer is a first conductivity type i layer, and the electrode formed on the light receiving surface is an ohmic electrode of one polarity, wherein the light receiving element comprises an ohmic electrode of the other polarity formed on the other surface of the light receiving layer directly or via a first conductivity type and low resistance GaN group semiconductor layer.

9. The light receiving element of claim 8, wherein the ohmic electrode of one polarity is formed as a transparent electrode to permit an entry of light.

10. The light receiving element of claim 8, wherein the ohmic electrode of one polarity is an opaque electrode and the light receiving surface has an area covered with the electrode and an incident area not covered with the electrode to permit entry of the light.

11. The light receiving element of claim 8, wherein the ohmic electrode of the other polarity is formed via a first conductivity type and low resistance GaN group semiconductor layer, the low resistance GaN group semiconductor layer and the light receiving layer are successively formed on a crystal substrate, an upper surface of the low resistance GaN group semiconductor layer is partially exposed, and the ohmic electrode of the other polarity is formed on this exposed surface.

12. The light receiving element of claim 11, wherein the crystal substrate is a sapphire crystal substrate, the low resistance GaN group semiconductor layer is an n^+ - GaN group semiconductor layer, the light receiving layer is an n^- - GaN group semiconductor layer, and the ohmic electrode of one polarity formed on the light receiving surface is a comblike electrode.